Tel: 612-617-6400 Fax: 612-617-6444

January 13, 1999

Ms. Joann Montgomery Woodward Clyde 2918 Indianapolis Blvd. Whiting. IN 46394

RE: Pace Project Number: 1011957

Client Project ID: PRJN 22088C31148X001

Dear Ms. Montgomery:

Enclosed are the results of analyses for sample(s) received on January 12, 1999. If you have any questions concerning this report, please feel free to contact me.

2134739245

Sincerely, Caroly Tout

Carolynne Trout Project Manager

Enclosures

Tel: 612-617-6400 Fax: 612-617-6444

DATE: 01/13/99

PAGE: 1

Woodward Clyde 2918 Indianapolis Blvd. Whiting, IN 46394 Pace Project Number: 1011957

Client Project ID: PRJN 22088C31148X001

Attn: Ms. Joann Montgomery

Phone:

Solid results are reported on a wet weight basis

Pace Sample No: Client Sample ID:	101054401 JLM032			Date Collect Date Recei		/11/99 /12/99		Matrix:	Water
Parameters		Results	Units	PRL	Analyzed	Analyst	CAS#	Footno	tes
*****************			********	•••					
GC/MS Volatiles		-							
en hit Voca by 9250	MM	Method	: EPA 8260			Prep Me	thod: EPA	8260	
GC/MS VOCs by 8260 Xylene (Total)	MIA	9000	ug/L	500	01/12/99	XZ	1330-20-7		
Dibromofluoromet	(2) ansh	88	*		01/12/99	XZ	1868-53-7		
Toluene-d8 (S)	nane (5)	94	Z .		01/12/99	XZ	2037-26-5	•	•
4.Bromofluoroben	zene (S)	88	×		01/12/99	XZ	460-00-4		
1,2-Dichloroetha		84	*	-	01/12/99	XZ	17060-07-0)	
	701054410			Date Colle	cted: 01	./11/99		Matrix:	Water
Pace Sample No: Client Sample ID:	101054419 TRIP BLANK			Date Rece		/12/99			
Parameters		Results	Units	PRL	Analyzed	Ana1ys	t CAS#	Footn	otes
*************		**********							-
GC/MS Volatiles									
GC/MS VOCs by 8260	A MN	Metho	d: EPA 8260			Prep M	ethod: EPA	8260	
Xylene (Total)	, 1111	ND	ug/L	5	01/12/99	XZ	1330-20-7	1	
Dibromofluoromet	thane (S)	86 -	X		01/12/99	XZ	1868-53-7		
Toluene-d8 (S)		94	*		01/12/99	XZ	2037-26-5		
4-Bromofluorobe	nzene (S)	90	*		01/12/99	XZ	460-00-4		
1,2-Dichloroeth		80	X		01/12/99	XZ	17060-07-	0	

Pace Analytical Services, Inc. 1700 Elm Street - Suite 200 Minneapolis, MN 55414

Tel: 612-617-6400 Fax: 612-617-6444

DATE: 01/13/99 PAGE: 2

Pace Project Number: 1011957

Client Project ID: PRJN 22088C31148X001

PARAMETER FOOTNOTES

Not Detected ND NC

Not Calculable

Pace Reporting Limit PRL

Surrogate (S)

> FROM : PACE ANALYTICAL SERVICES TO 2194739245 21-10'6661 70/40.9 E47# 14:53

Woodward-Clyge Consultants

Mr. Steven Judeth Indiana Department of Environmental Management October 9, 1998 Page 2

Figures 1 and 2 present the extent of corrected FPX thickness at the site on June 1, 1998, and August 19, 1998, respectively. The volume of FPX present was calculated using the average thickness of FPX between each contour line assuming a porosity of 0.30 for fine to medium sand (Applied Hydrogeology, Fetter, 1980). The volume of FPX in the soil was calculated using a methodology that is consistent with other Amoco Whiting projects. The calculated volumes are a best estimate of FPX in the ground and can be influenced by site conditions including varying groundwater elevations and FPX buildup around remediation systems. This information is best used to evaluate long-term trends of FPX volumes.

The estimated volume of FPX present at the site on June 1, 1998 was 8,800 gallons. The estimated volume of FPX present at the site on August 19, 1998 was 8,500 gallons. The FPX volume has decreased approximately 300 gallons between June 1 and August 19, 1998. The volume of FPX increased in the center part of the site near the north leg of the well point system, while the volume of the FPX decreased on the southwest part of the site near the west leg of the well point system. FPX was not detected in three of the four vacuum recovery devices (VRDs) that were measured in the center of the western leg of the well point system. Both increases and decreases of FPX thickness were observed at monitoring points between June 1 and August 19. FPX thickness increased in well JLM031, and piezometers PZX-4 and PZX-7 (increases of 0.35 feet, 0.16 feet, and 0.21 feet, respectively). FPX thickness decreased in well JLM029 and piezometer PZX-8 (decreases of 0.31 feet and 0.17 feet, respectively). There were other minor fluctuations in FPX thickness in wells and piezometers.

Increases and decreases of FPX thickness were also measured in VRDs. These changes may be due to a VRD being clogged or to the system being shut down for repairs or other reasons.

Recovery System

The J-162 recovery system is inspected weekly by the Whiting Environmental Inspector (EI). The recovery system includes 34 well points and VRDs. The former recovery well, RWX-1, has a VRD in it and is not used for pumping groundwater. The weekly activities of the EI include recording the total flow of the system and collecting a sample of groundwater from the system for measurement of percent-hydrocarbon emulsion in a graduated cylinder.

During this reporting period, the system recovered approximately 5,580,000 gallons of groundwater containing dissolved phase xylenes and FPX (see Figure 3). The average weekly flow of fluid recovery for this reporting period was approximately 55 gallons per minute (see Figure 4). The hydrocarbon emulsion in the J-162 effluent for the third quarter of 1998 ranged from a film to 1 percent (see Figure 5).



Woodward-Clyge Consultants

Mr. Steven Judeth
Indiana Department of Environmental Management
October 9, 1998
Page 3

Annual Groundwater Sampling

The annual groundwater sampling event was performed on August 19, 1998. Of the four monitoring wells and eight piezometers, only well JLM032 did not contain FPX. A groundwater sample was collected from well JLM032 and submitted to Pace Analytical Services, Inc. of Minneapolis, Minnesota for analysis of total xylenes. The concentration of xylenes was 3.80 mg/L. Well JLM032 is on the City of Hammond property, and due to previous detections, is sampled quarterly. The xylene concentration at well JLM032 in June 1998 was 0.15 mg/L.

If you have any questions regarding this report, please call either of the undersigned at (312) 939-1000.

Sincerely,

Joanne Montgomery

Staff Geologist

Timothy M. Black Project Manager

Attachments

cc:

V. Kremesec (Amoco)

D. Kalet (Amoco)

K. Fase (Amoco)

L. Malnor (Amoco)

C.K. Yukawa (WCIA)

Milan Kruszynski (HDEM)

File

H:\NED\3QIDEM98.DOC



JUNE 1, 1998 AND AUGUST 19, 1998 FLUID LEVEL MEASUREMENTS AMOCO PIPELINE XYLENE AREA AMOCO OIL COMPANY HAMMOND, INDIANA TABLE 1

Г			2	Г	_	Γ			Π				Ι		_	Γ	Γ			Г				<u> </u>	Γ
	CORRECTED	FPX	THICKNESS ²	0.53	0.14	1.12	00.0	0.26	0.14	0.82	0.37	0.08	0.03	1.57	0.47	0.00	90.0	00'0	00'0	0.34	0.02	0.29	0.25	0.18	000
August 19, 1998		DEPTH TO	FPX	6.15	3.13	3.95	Q	79.7	9:36	6.20	6.65	6.35	7.55	7.30	8.98	Q	12.84	QN	11.65	7.84	9.32	8.59	8.30	9.78	10.70
August	CORRECTED	QW O	ELEVATION ¹	579.04	581.50	579.93	581.22	580.17	578.68	580.62	578.47	577.33	577.89	576.35	578.77	ΨX	ΑN	NA	AN	ΑN	NA	ΑN	ΝΑ	NA	NA
		DEPTH TO	œΜ	9.38	4.02	10.80	2.43	9.26	10.20	11.25	8.90	6.82	7.71	16.95	11.85	12.85	13.20	10.15	11.67	9.94	9.45	10.35	9.85	10.87	10 80
	CORRECTED	FPX	THICKNESS ²	0.84	0.07	0.77	0.00	0.22	0.08	06.0	0.21	0.07	0.05	1.36	0.64	0.14	00.00	0.00	NM	0.31	0.02	0.24	0.25	0.04	ΣN
June 1, 1998		DEPTH TO	FPX	5.87	2.62	3.72	ND	7.26	9.67	5.85	6.87	6.51	7.61	69.7	9.40	12.35	QN	ND	MN	8.40	9.21	9.15	8.44	9.65	MΝ
) aune	CORRECTED	δW	ELEVATION1	579.04	582.07	580.46	582.14	580.61	578.42	580.90	578.38	577.18	577.80	576.14	578.20	NA	NA	NA	NM	NA	NA	NA	NA	NA	MN
		DEPTH TO	GW	11.06	3.08	8.44	1.51	8.61	10.19	11.40	8.13	6.97	7.94	16.02	13.33	13.24	14.95	96.6	NM	10.32	9.33	10.64	9.92	9:30	ΣZ
		TOTAL	DEPTH	12.68	13.57	15.80	15.23	16.73	19.48	18.36	16.83	16.11	17.95	17.28	18.22	NA	ΑN								
	TOP OF CASING	ELEVATION,	NGVD FT	585.64	584.75	584.84	583.65	588.06	588.16	587.53	585.43	583.75	585.46	585.00	588.15	NA	NA	AA	NA	NA	NA	NA	ΝΑ	AN	ΨN
			LOCATION	JLM029	JLM030	JLM031	JLM032	PZX-1	PZX-2	PZX-3	PZX-4	PZX-5	PZX-6	PZX-7	PZX-8	JLV001	JLV005	JLV010	JLV014	JLV015	JLV020	JLV025	JLV030	JLV034	RWX-1

All measurements are in feet.

ND Not detected

NM Not measured

NA The surveyed elevations and total depths for the JLV well points are not available. The total depths are approximately 16 feet. FPX Free Phase Xylenes

'If FPX was detected the groundwater elevations were corrected according to the following formula:

 $\mathrm{GW_c} = \mathrm{GW_m}^* \, (\mathrm{SG} + (\mathrm{FPX_m}))$ where $\mathrm{GW_c} = \mathrm{corrected}$ groundwater elevation, $\mathrm{GW_m} = \mathrm{measured}$

groundwater elevation, SG = specific gravity of free phase xylenes, and FPX_m = measured thickness of FPX. ²Corrected free phase xylenes thickness in the formation was calculated according to the following formula:

 ${\sf FPX_c} = {\sf FPX_m}^*$ ((1-SG) / SG) where ${\sf FPX_c} =$ corrected free phase xylenes thickness, ${\sf FPX_m} =$ measured free phase xylenes



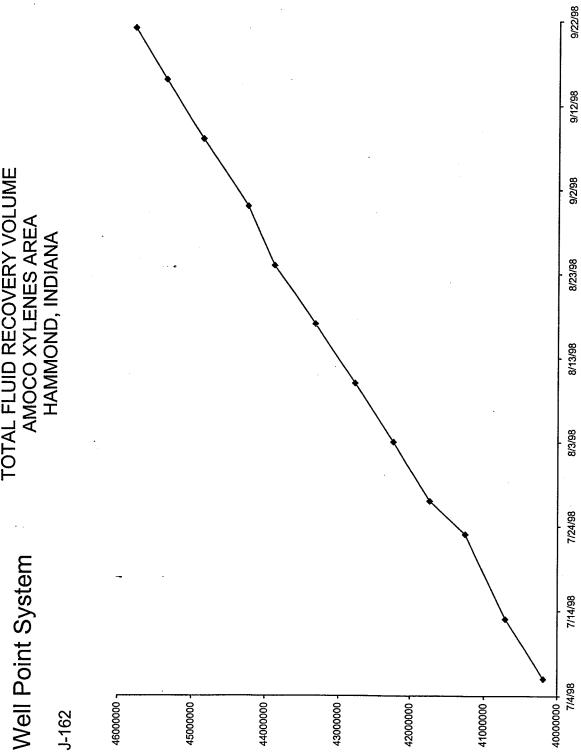


FIGURE 4
AVERAGE FLUID RECOVERY RATE
AMOCO XYLENES AREA
HAMMOND INDIANA



J-162

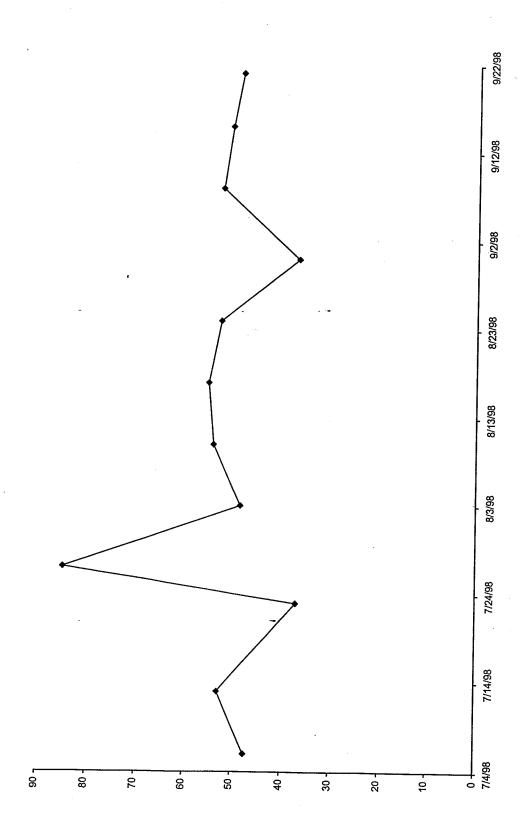
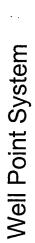
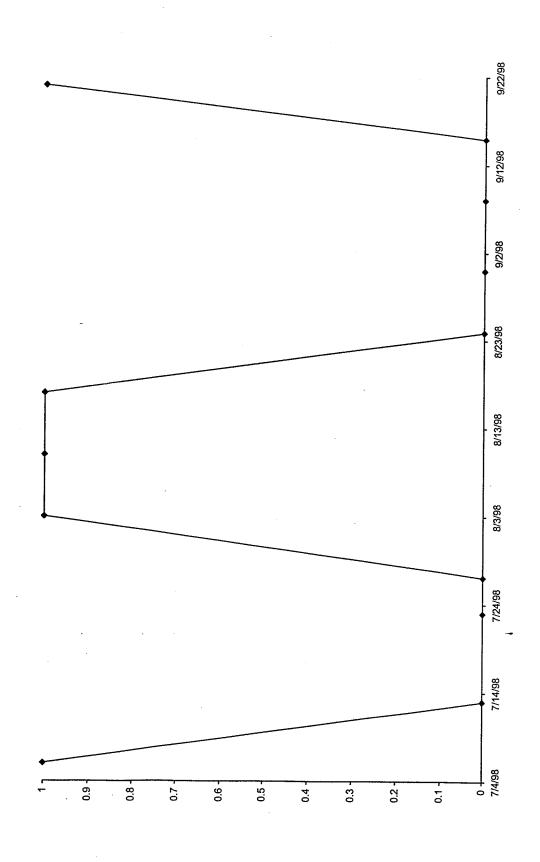


FIGURE 5
PERCENT HYDROCARBON EMULSION
AMOCO XYLENES AREA
HAMMOND, INDIANA



J-162



Tel: 612-617-6400 Fax: 612-617-6444

August 28, 1998

Ms. Joann Montgomery Woodward Clyde 2918 Indianapolis Blvd. Whiting, IN 46394

Pace Project Number: 109178

Client Project ID: Project: 88C3114-8X001

Dear Ms. Montgomery:

Enclosed are the results of analyses for sample(s) received on August 20, 1998. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Project Manager

Enclosures

Pace Analytical Services, Inc. 1700 Eim Street - Suite 200 Minneapolis, MN 55414

> Tel: 612-617-6400 Fax: 612-617-6444

DATE: 08/28/98

PAGE: 1

Woodward Clyde 2918 Indianapolis Blvd. Whiting, IN 46394

Pace Project Number: 109178

Client Project ID: Project: 88C3114-8X001

Attn: Ms. Joann Montgomery

Phone:

Solid results are reported on a wet weight basis

Pace Sample No: Client Sample ID:	10800860 JLM032			Date Collect Date Recei		3/19/98 3/20/98	M	atrix:	Water	
Parameters	• • • • • • • • • • • • • • • • • • • •	Results	Units	PRL	Analyzed	Analyst (CAS#	Footno	tes	
GC/MS VOA										
GC/MS VOCs by 8260	MN	Method	: EPA 8260	-		Prep Metho	nd. FPA 8	260		
Xylene (Total)		3800	ug/L	50	08/24/98		30-20-7	200		
Dibromofluorometh	hane (S)	108	*		08/24/98		58-53-7			
Toluene-d8 (S)		110	x		08/24/98		37-26-5			
4-Bromofluorobenz		96	X X		08/24/98	TAW 460	0-00-4			
1.2-Dichloroethar	ne-d4 (S)	102	X		08/24/98	TAW 170	060-07-0			
	10800878 TRIP BLANK			Date Collec		/19/98	М	atrix:	Water	
Pace Sample No: Client Sample ID:	10800878 TRIP BLANK			Date Collec Date Recei		/19/98 /20/98	M	atrix:	Water	
		Results	Units		ved: 08	/20/98		atrix:		
Client Sample ID:			Units	Date Recei	ved: 08					
Client Sample ID:			Units	Date Recei	ved: 08	/20/98				
Client Sample ID: Parameters	TRIP BLANK	Results	Units	Date Recei	ved: 08	/20/98 Analyst (CAS#	Footnot		
Client Sample ID: Parameters GC/MS VOA	TRIP BLANK	Results	•••••	Date Recei	ved: 08	/20/98 Analyst (CAS# od: EPA 82	Footnot		
Client Sample ID: Parameters GC/MS VOA GC/MS VOCs by 8260 Xylene (Total) Dibromofluorometh	TRIP BLANK	Results Method	: EPA 8260	Date Recei	ved: 08 Analyzed	/20/98 Analyst (CAS# od: EPA 82 80-20-7	Footnot		
Client Sample ID: Parameters GC/MS VOA GC/MS VOCs by 8260 Xylene (Total) Dibromofluorometh Toluene-d8 (S)	TRIP BLANK MN mane (S)	Results Method ND	EPA 8260 ug/L *	Date Recei	ved: 08 Analyzed 08/24/98	/20/98 Analyst (Prep Methor TAW 133 TAW 186	CAS# od: EPA 82	Footnot		
Client Sample ID: Parameters GC/MS VOA GC/MS VOCs by 8260 Xylene (Total) Dibromofluorometh	TRIP BLANK MN mane (S) zene (S)	Results Method ND 98	EPA 8260 ug/L	Date Recei	ved: 08 Analyzed 08/24/98 08/24/98	Analyst (Prep Metho TAW 133 TAW 186 TAW 203	CAS# od: EPA 82 80-20-7 88-53-7	Footnot		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, Inc. 1700 Elm Street - Suite 200 Minneapolis, MN 55414

> Tel: 612-617-6400 Fax: 612-617-6444

DATE: 08/28/98

PAGE: 2

Pace Project Number: 109178

Client Project ID: Project: 88C3114-8X001

PARAMETER FOOTNOTES

ND Not Detected
NC Not Calculable
PRL Pace Reporting Limit

(S) Surrogate

[1] Spiked sample recovery is not within control limits.

[2] Confirmed by second analysis.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

URS Greiner Woodward Clyde

A Division of URS Corporation

January 14, 1999

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. Steven Judeth
Office of Enforcement
Indiana Department of Environmental Management
100 North Senate Avenue
P.O. Box 6015
Indianapolis, Indiana 46206-6015



Chicago, IL 60603

Tel: 312.939.1000 Fax: 312.939.4198

Offices Worldwide

122 South Michigan Avenue, Suite 1920

Subject:

Amoco Oil Company and Amoco Pipeline Company, Cause No. B-1545,

Free Phase Xylene Recovery - 4th Quarter 1998 Report

Dear Mr. Judeth:

URS Greiner Woodward Clyde (URSGWC), on behalf of Amoco Pipeline Company, submits this free phase xylene (FPX) quarterly report for the Amoco Pipeline Xylene Site located at 129th Street and Calumet Avenue in Hammond Indiana. This quarterly report is for the period from September 22, 1998 through December 31, 1998. This report also presents the analytical results for the quarterly groundwater sampling event.

Groundwater Elevations

WCIA performed fluid level measurements on December 7, 1998 in site monitoring wells and selected well points. The depth to product and depth to groundwater were measured at each location. The field measurements and corrected groundwater elevations are presented in Table 1. The groundwater elevations are depressed between the well point system and the xylene pumphouse due to pumping of groundwater by the well point system.

FPX Thickness

Table 1 also presents the corrected FPX thickness for the wells and well points for December 7, 1998. The FPX thickness has been corrected based on the specific gravity value of xylene (0.86).

The formula used to correct the FPX thickness is presented below:

 $FPX_c = FPX_m * ((1-SG) / SG)$ where:

 FPX_C = corrected FPX thickness; FPX_m = measured FPX thickness; and SG = specific gravity of FPX

Mr. Steven Judeth Indiana Department of Environmental Management January 14, 1999 Page 2

Figures 1 and 2 present the extent of corrected FPX thickness at the site on August 19, 1998, and December 7, 1998, respectively. The volume of FPX present was calculated using the average thickness of FPX between each contour line assuming a porosity of 0.30 for fine to medium sand (Applied Hydrogeology, Fetter, 1980). The volume of FPX in the soil was calculated using a methodology that is consistent with other Amoco Whiting projects. The calculated volumes are a best estimate of FPX in the ground and can be influenced by site conditions including varying groundwater elevations and FPX buildup around remediation systems. This information is best used to evaluate long-term trends of FPX volumes.

The estimated volume of FPX present at the site on August 19, 1998 was 8,500 gallons. The estimated volume of FPX present at the site on December 7, 1998 was 9,900 gallons. The FPX volume has increased approximately 1,400 gallons between August 19 and December 7, 1998. The volume of FPX decreased on the south and southwest part of the site, while the volume of the FPX increased in the center part of the site near the north leg of the well point system. Both increases and decreases of FPX thickness were observed at monitoring points between August 19 and December 7. FPX thickness increased in well JLM031, and piezometers PZX-6 and PZX-8 (increases of 0.41 feet, 0.26 feet, and 0.11 feet, respectively). FPX thickness decreased in well JLM029 and piezometers PZX-1, PZX-3, and PZX-4 (decreases of 0.46 feet, 0.18 feet, 0.12 feet, and 0.11 feet, respectively). There were other minor fluctuations in FPX thickness in wells and piezometers.

Increases and decreases of FPX thickness were also measured in VRDs. These changes may be due to a VRD being clogged or to the system being shut down for repairs or by the migration of FPX toward the wellpoint system.

Recovery System

The J-162 recovery system is inspected weekly by the Whiting Environmental Inspector (EI). The recovery system includes 34 well points and VRDs. The former recovery well, RWX-1, has a VRD in it and is not used for pumping groundwater. The weekly activities of the EI include recording the total flow of the system and collecting a sample of groundwater from the system for measurement of percent-hydrocarbon emulsion in a graduated cylinder.

During this reporting period, the system recovered approximately 8,463,000 gallons of groundwater containing dissolved phase xylenes and FPX (see Figure 3). The average weekly flow of fluid recovery for this reporting period was approximately 70 gallons per minute (see Figure 4). The hydrocarbon emulsion in the J-162 effluent for the fourth quarter of 1998 ranged from a film to 1 percent (see Figure 5).

Mr. Steven Judeth Indiana Department of Environmental Management January 14, 1999 Page 3

Quarterly Groundwater Sampling

The quarterly groundwater sampling event was performed on January 11, 1999. The fluid level measurement of monitoring well JLM032 was taken at this time. Of the four monitoring wells and eight piezometers at this site, only well JLM032 did not contain FPX. A groundwater sample was collected from well JLM032 and submitted to Pace Analytical Services, Inc. of Minneapolis, Minnesota for analysis of total xylenes. The concentration of xylenes on January 11, 1999 was 9.0 mg/L. The xylene concentration at well JLM032 in August 1998 was 3.80 mg/L.

If you have any questions regarding this report, please call either of the undersigned at (312) 939-1000.

Sincerely,

Joanne Montgomery

Sr. Staff Geologist

Timothy M. Black Project Manager

Ti Bluk

Attachments

cc:

V. Kremesec (Amoco)

D. Kalet (Amoco)

K. Fase (Amoco)

L. Malnor (Amoco)

C.K. Yukawa (WCIA)

Milan Kruszynski (HDEM)

File

AUGUST 19, 1998 AND DECEMBER 7, 1998 FLUID LEVEL MEASUREMENTS AMOCO PIPELINE XYLENE AREA AMOCO OIL COMPANY HAMMOND, INDIANA

				Angust	August 19, 1998			Decembe	December /, 1998	
	TOP OF			CORRECTED		CORRECTED		CORRECTED		CORRECTED
	FLEVATION.	TOTAL	DEPTH TO	ВW	DEPTH TO	FPX	DEPTH TO	OW.	DEPTH TO	FPX
OCATION	NGVD FT	DEPTH	ВW	ELEVATION1	FPX	THICKNESS ²	GW	ELEVATION1	FPX	THICKNESS
	585.64	12.68	9.38	579.04	6.15	0.53	6.25	62.629	5.79	0.07
LM030	584.75	13.57	4.02	581.50	3.13	0.14	3.37	581.97	2.68	0.11
	584.84	15.80	10.80	579.93	3.95	1.12	12.61	580.31	3.21	1.53
1 M032	583.65	15.23	2.43	581.22	QN	0.00	2.253	581.40	Q	0.00
	588.06	16.73	9.26	580.17	79.7	0.26	7.45	581.02	6.97	0.08
	588.16	19.48	10.20	578.68	9.36	0.14	6.80	581.65	6.46	90.0
	587.53	18.36	11.25	580.62	6.20	0.82	9.29	581.92	5.01	0.70
	585 43	16.83	8.90	578.47	6.65	0.37	7.46	579.35	5.86	0.26
	583.75	16.11	6.82	577.33	6.35	0.08	6.16	578.05	5.62	60:0
	585.46	17.95	7.71	577.89	7.55	0.03	8.31	578.67	6.54	0.29
	585 00	17.28	16.95	576.35	7.30	1.57	15.29	578.11	5.52	1.59
	588.15	18.22	11.85	578.77	8.98	0.47	11.31	579.89	7.76	0.58
	NA	AN	12.85	AN	QN	00.0	13.34	AN	13.02	0.05
	AN A	ΑX	13.20	ΑN	12.84	0.06	14.33	NA	12.80	0.25
II V010	Ϋ́	AA	10.15	Ą	QN	0.00	90.6	AA	Q	0.00
	¥	ΑĀ	11.67	NA	11.65	0.00	ΣZ	NA	ΣZ	ΣZ
1 V015	Ϋ́	ΑN	9.94	AN A	7.84	. 0.34	8.59	NA	7.27	0.21
1 V020	¥	ΑN	9.45	Ϋ́	9.32	0.02	9.75	NA	8.03	0.28
1 V025	AN	Ϋ́	10.35	ΝΑ	8.59	0.29	10.77	NA	7.54	0.53
	¥N Y	Ϋ́Z	9.85	ΑN	8.30	0.25	6.58	NA	6.29	0.05
II V034	AN AN	ΑN	10.87	NA	9.78	0.18	10.98	NA	9.34	0.27
	AN		10.80	ΑN	10.70	0.02	7.16	ΝΑ	7.15	0.00

NOTES:

All measurements are in feet.

ND Not detected

NM Not measured

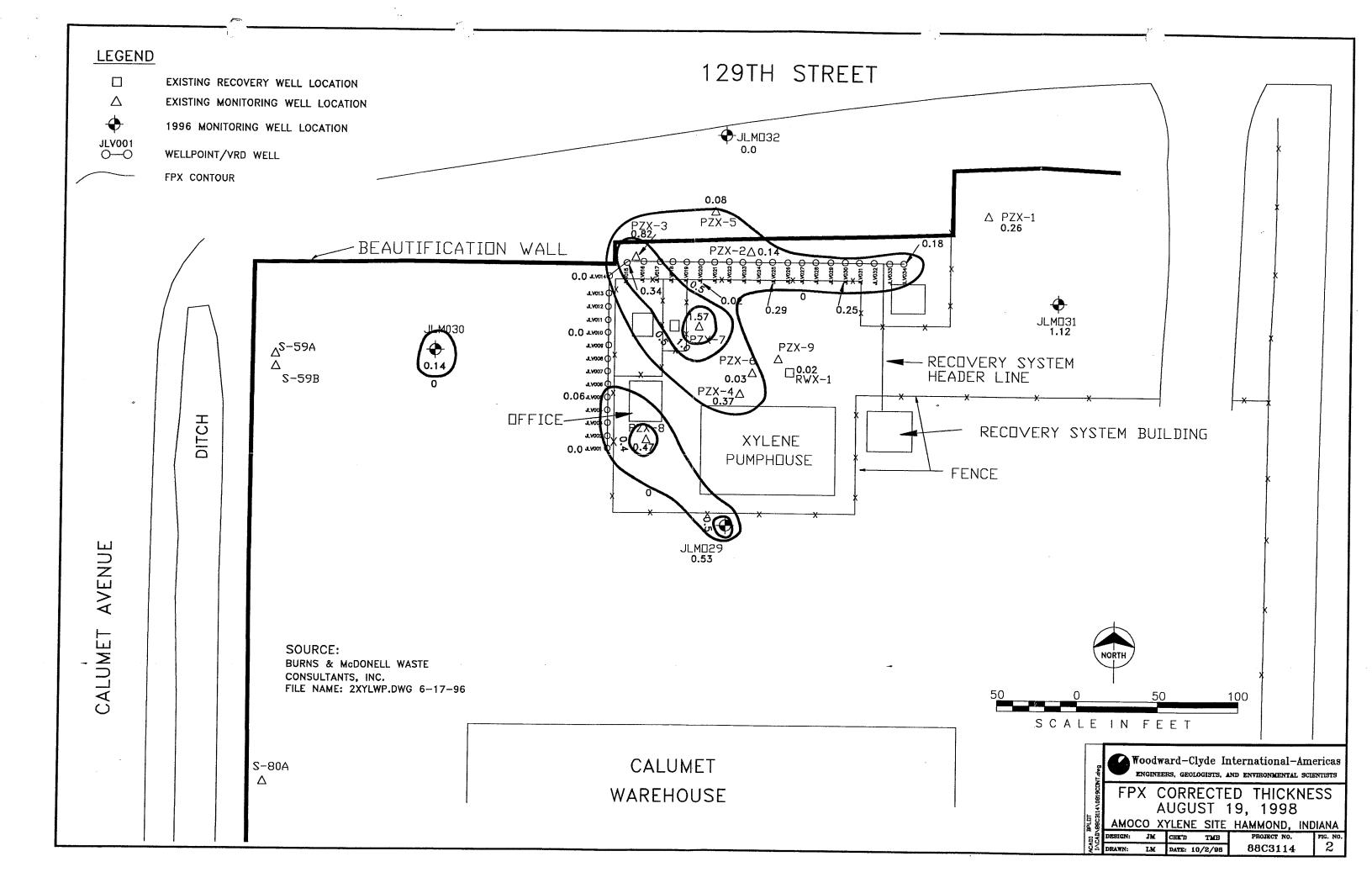
NA The surveyed elevations and total depths for the JLV well points are not available. The total depths are approximately 16 feet. FPX Free Phase Xylenes

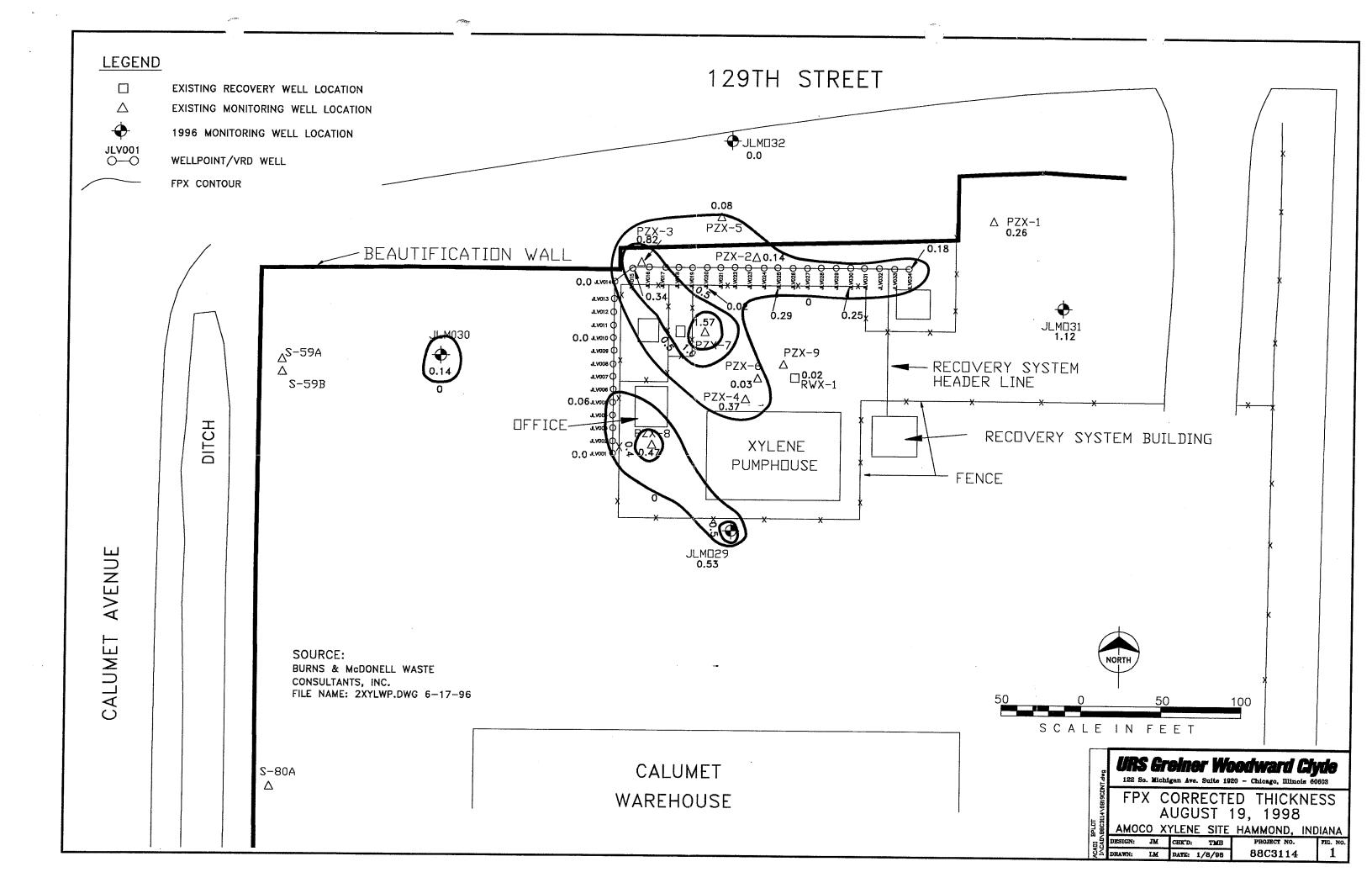
If FPX was detected the groundwater elevations were corrected according to the following formula: $GW_c = GW_m^* (SG + (FPX_m))$ where $GW_c =$ corrected groundwater elevation, $GW_m =$ measured

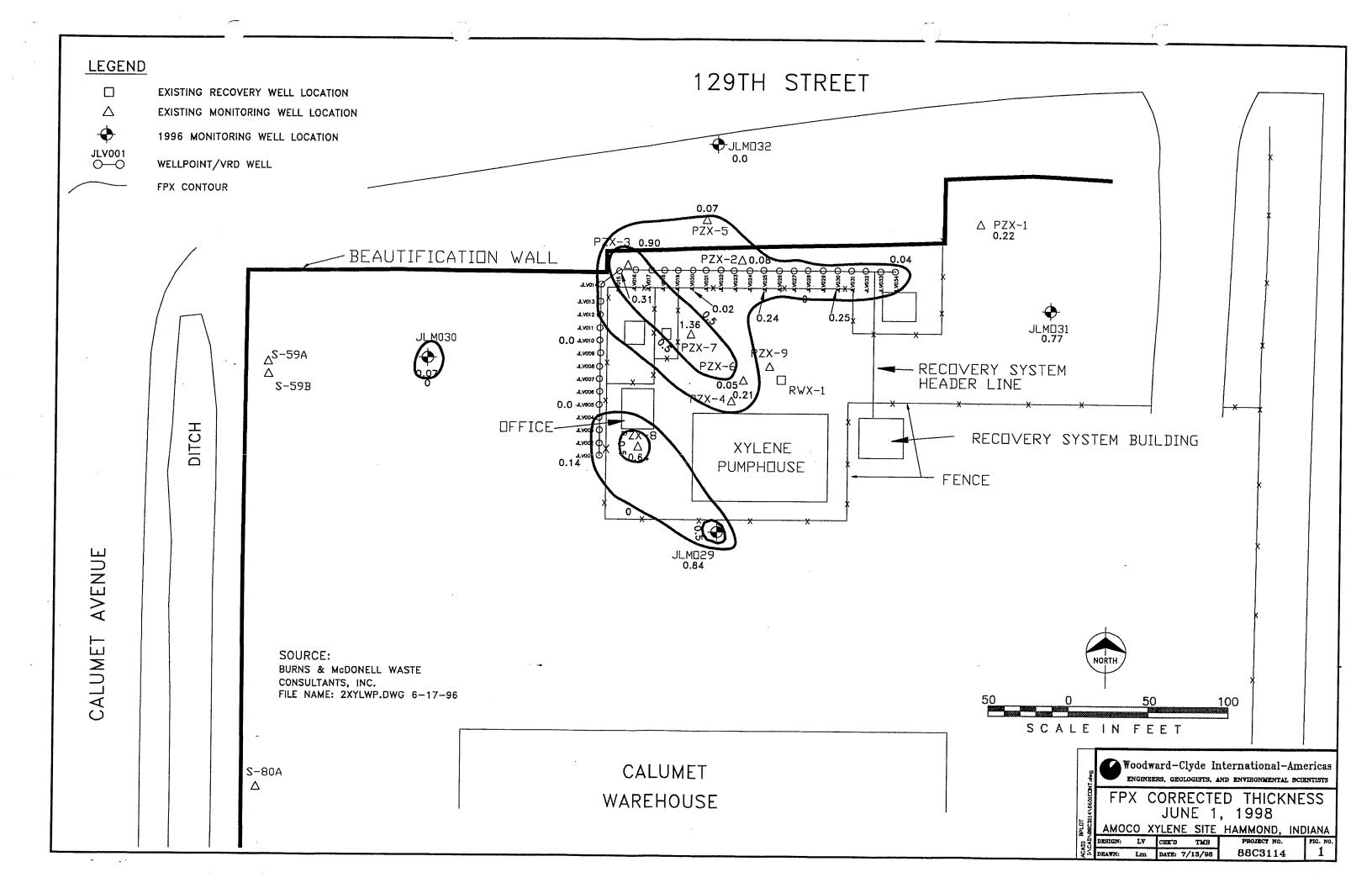
groundwater elevation, SG = specific gravity of free phase xylenes, and FPX_m = measured thickness of FPX. ²Corrected free phase xylenes thickness in the formation was calculated according to the following formula:

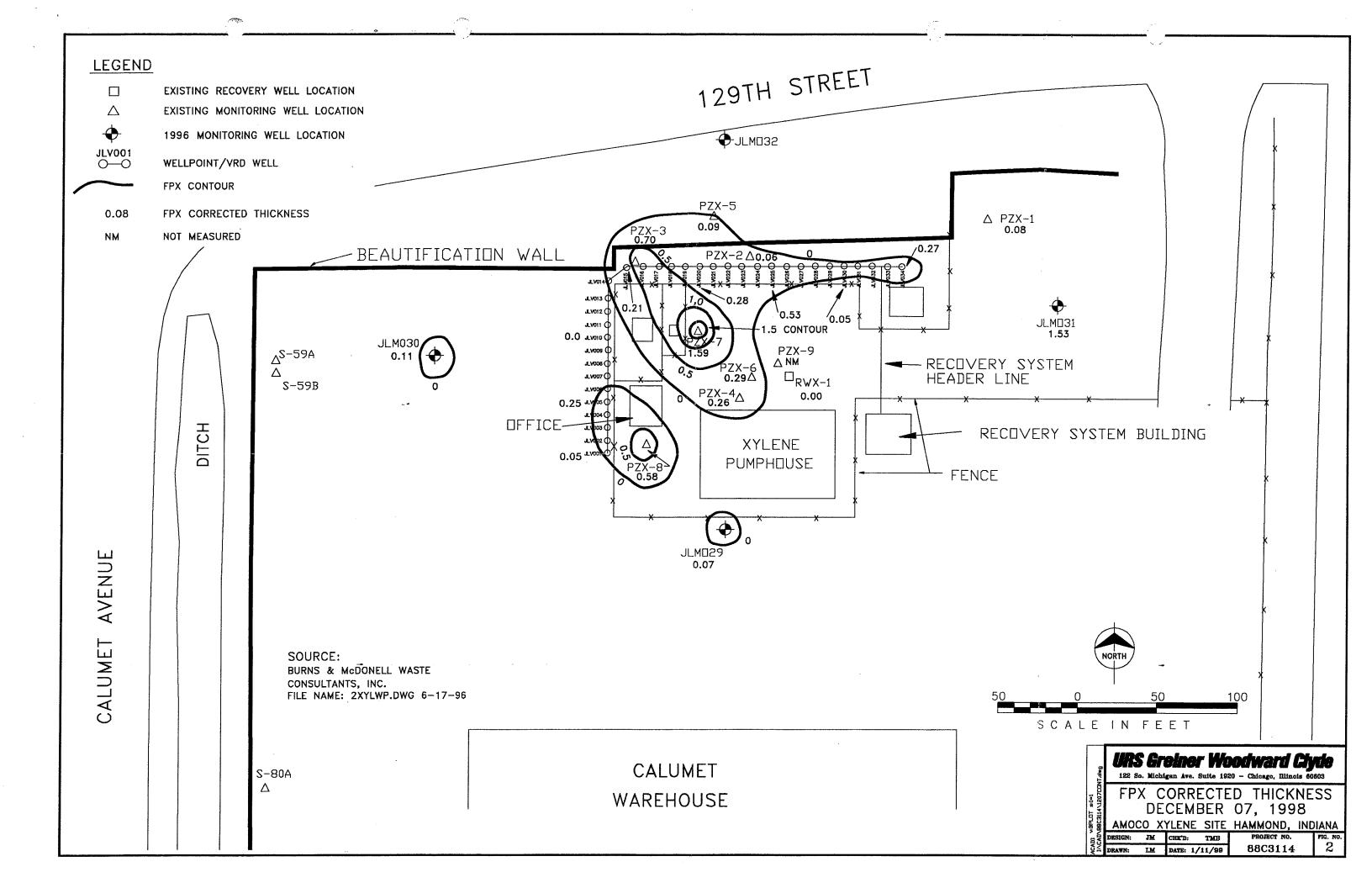
 ${\rm FPX_c}={\rm FPX_m}^*$ ((1-SG) / SG) where ${\rm FPX_c}=$ corrected free phase xylenes thickness, ${\rm FPX_m}=$ measured free phase xylenes

³ Fluid level measurement for monitoring well JLM032 taken on January 11, 1999











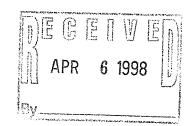
CERTIFIED MAIL RETURN RECEIPT REQUESTED

March 31, 1998

Mr. Stephen Judith
Indiana Department of Environmental Management
Office of Enforcement
Water Enforcement Section
100 North Senate Street
P.O. Box 6015
Indianapolis, IN 46206-6015

Amoco Petroleum Products Refining Business Group Whiting Refinery

2815 Indianapolis Boulevard Post Office Box 710 Whiting Indiana 46394-0710 219-473-7700



Upset Conditions Resulting from March 9 Power Outage

On March 9, 1998 the Amoco Whiting Refinery and the refinery's wastewater treatment plant (WWTP) experienced a complete power outage as a result of the severe winter storm and ensuing NIPSCO area-wide power outage. As a direct result of the power outage, the WWTP experienced an upset condition, resulting in NPDES permit exceedances. The following information documents these issues.

Description of Power Outage

A severe winter storm with extremely high winds, wet snow and ice, impacted Northwest Indiana on March 9, 1998. That morning, the NIPSCO Electrical Grid for Northwest Indiana experienced power outages. This grid supplies Amoco and is considered to be a highly reliable system. However at 8:39am, weather conditions caused NIPSCO's Sheffield substation connection to the refinery to be lost. Normally the loss of this connection would not have presented an immediate problem since a second electrical connection from NIPSCO's Marktown substation to the refinery is also in place. Yet, sixteen seconds after losing the Sheffield connection, NIPSCO's electric generation source to the Marktown substation was also lost. Thus, the supply of electrical power from NIPSCO to the refinery was completely lost.

Since Amoco's internal power station cannot produce all the electricity the refinery requires, the refinery's electrical load-shed system automatically started tripping process unit breakers, according to a prioritized schedule, shutting down many of the refinery's process units. The WWTP is considered high priority and is not on this load-shed list; it receives power as long as the power station is operational.

However, at 8:52am, when the Amoco power station could not handle the remaining load, the WWTP was among the units that lost electrical power.

Effect of Power Outage on WWTP Operations.

The loss of power to the WWTP resulted in the following equipment outages (please refer to the attached WWTP flow diagram):

- All pumps in the pretreatment section of the WWTP were unoperable. Incoming flow built up in the the oil-water separator and air flotation unit.
- Due to loss of compressed air, the air flotation unit could not remove dissolved oil and suspended solids. This allowed unusually high loadings of dissolved oil and grease and suspended solids to the aeration tanks when flow was reestablished.
- Surface aerators lost power. The residual dissolved oxygen that is normally
 maintained in the aeration tanks was quickly consumed, within minutes of the
 power outage. This led to near-anaerobic conditions in the aeration tanks while
 the aerators were shut down.
- The clarifier recycle pumps were unoperable.
- The final filter backwash pumps were unoperable.
- Due to blizzard, sub-freezing conditions and the loss of steam tracing, which is used for freeze protection, many critical indicators and controllers were frozen.

Recovery of WWTP Operations on March 9

As discussed above, all refinery process units, including the WWTP, were shut down due to the power outage. The NIPSCO Marktown substation connection to the refinery was reestablished first and the WWTP's electrical power supply was reestablished by approximately 10:30am, resulting in a power outage of approximately 90 minutes. Although the WWTP was the first refinery unit to be restored to operation, many refinery process units were shut down for several days and some as long as 10 days.

WWTP personnel were able to restore most major equipment operation by early afternoon. This included pumps required to reestablish flow through the plant, including the clarifier recycle pumps and final filter backwash pumps. The aeration tank surface aerators were reactivated.

Steam and air supply remained out-of-service throughout the refinery until later in the day. Given the blizzard and sub-freezing conditions, instrumentation froze and had to be manually thawed with steam hoses and restarted. Due to these instrumentation problems, flow to the storm surge and equalization tanks was not reestablished until later in the day.

Until the air supply was reestablished later in the afternoon, the air flotation unit was not effective in removing suspended solids and dissolved oil from the

wastewater, resulting in very high loadings of suspended solids and dissolved oil and grease to the aeration tanks.

Summary of Exceedances

Loss of power to the WWTP resulted in an upset condition. As discussed, unusually high loadings of suspended solids and dissolved oil to the aeration tanks, combined with the earlier period of anaerobic conditions (while the aerators were shut down), resulted in highly-stressed activated sludge. This resulted in severe foaming in the aeration tanks and clarifiers.

Although the clarifier beds were maintained during this incident, some of the foaming activated sludge did not sufficiently settle in the clarifiers. This condition overwhelmed the final filters and resulted in high suspended solids levels in the effluent. Final filters were backwashed one every 20 minutes (the maximum rate possible), as opposed to the normal frequency of one every 60-90 minutes. This demonstrates that operational measures available to the WWTP to mitigate the extent of the exceedances were implemented.

In addition, high loadings of dissolved oil and grease to the activated sludge reactors led to high levels in the effluent. The combination of high levels of both suspended solids (TSS) and oil and grease (O&G) led to high levels of both chemical oxygen demand (COD) and biological oxygen demand (BOD) in the effluent. The daily maximum permit limits for TSS, O&G, COD and BOD were exceeded on March 9. Since the upset condition continued into March 10, these limits were also exceeded on March 10. Notifications of these exceedances were made to IDEM, Office of Enforcement. Below is a summary of NPDES permit exceedances for Outfall 001 (WWTP effluent) on March 9 and 10.

as pounds/day	TSS	O&G	COD	BOD
March 9	46,402	2,705	63,782	9,674
March 10	61,159	2,723	75,429	19,833
March 11	1,348	749	7,040	1,168
Daily Maximum Limit	5,694	2,600	58,427	8,164

Since Wednesday, March 11, all NPDES daily maximum permit limits for Outfall 001 have been met. In fact, WWTP operating data indicate that the effluent quality was much improved by noon on Tuesday, March 10. Given the magnitude of equipment outages on March 9 and the subsequent upset conditions, this demonstrates that effective measures were taken by WWTP personnel to return the WWTP to a highly functional state in an expedited manner.

Although not an exceedance of a daily maximum permit limit, there was also an unsightly appearance at Outfall 001 on March 17. A film was observed within 25 feet of the outfall and discoloration within 100 feet. IDEM, Office of Enforcement, was notified of this condition as well. This outfall condition cleared up over the next several days. As mentioned earlier, a foam layer had built up on top of the clarifiers during the upset condition. This foam slowly sloughed-off the clarifiers; however, the filters were not completely effective in removing it.

There was one exceedance on March 11 for O&G for Outfall 002, the once through cooling water (OTCW) effluent. This was also related to the power outage. Heat exchangers on the OTCW system were kept as warm as possible during the shut-down period with OTCW. However, heat exchanger operating conditions were very different during the shut-down than normal operating conditions, especially pressure and temperature conditions. This led to a small heat exchanger leak. Operating conditions were adjusted and the leak was stopped. Monitoring of heat exchanger systems throughout the refinery was enhanced throughout the refinery start-up period. There were no further Outfall 002 exceedances.

NPDES Permit Definition of "Upset"

The permit exceedances discussed above were unintentional and temporary and were due to factors beyond the reasonable control of the permittee. The WWTP is well-operated, well-maintained, and designed to readily meet its NPDES permit conditions. This is demonstrated by the refinery's excellent NPDES permit record. No operational errors contributed to the exceedances.

In accordance with NPDES Permit No. IN0000108 (Part II, Section B, Paragraph 3.C), the following addresses conditions necessary to demonstrate an upset.

- 1. The cause of the upset was identified as the NIPSCO power outage, which was caused by severe and unusual winter storm weather conditions.
- 2. The WWTP was at the time of the upset being operated according to proper operation and maintenance procedures.
- 3. The refinery and the WWTP took all reasonable steps, including the following, to minimize any adverse impact to the environment resulting from the upset.

First, full operation of the WWTP was achieved as quickly as possible. The WWTP was first refinery unit to regain power. In fact, most of refinery units remained out of service for up to several days afterward, some up to 10 days. In spite of highly adverse weather conditions, instrumentation freeze-ups and other difficulties, the WWTP was running by early afternoon and was fully operational by late afternoon of March 9.

Second, WWTP operational measures were taken to minimize the impact of the upset. At no time during the upset was wastewater flow bypassed around any of the WWTP operating units. Surge capacity was used. Final filter backwash frequency was increased to the maximum rate. Clarifier beds were maintained.

Third, in order to reduce wastewater flow to the WWTP, the watershedding system was activated: all wellpoint systems were temporarily shutdown; tank waterdraws were delayed; cooling tower blow-downs were blocked in; desalter brine and mudwashes and other refinery process related flows were not in service for several days.

Fourth, in order to reduce slop oil flow to the WWTP's oil-water separator several vac trucks were operated within the refinery around the clock for several days.

Fifth, as the refinery process units were brought back in service, measures were taken to mitigate any impact on WWTP operations. As a result, the WWTP was able to meet its permit limits with its NPDES permit even though essentially the entire refinery had to be brought back in service.

Summary

As a direct result of the NIPSCO power outage on March 9, which was caused by severe and unusual winter storm weather conditions, the WWTP experienced an upset condition. Daily maximum NPDES permit limits for Outfall 001 (WWTP effluent) were exceeded on March 9 and March 10. Full operation of the WWTP was restored by the afternoon of March 9. Outfall 001 maximum daily permit limits were met March 11. Also upset-related, Outfall 002 (once through cooling water) experienced an exceedance on March 11, and Outfall 001 had an unsightly appearance on March 17.

If you have any questions regarding the upset condition described above, or any other issue, please call me at 219-473-3740.

Peter B. Beronio

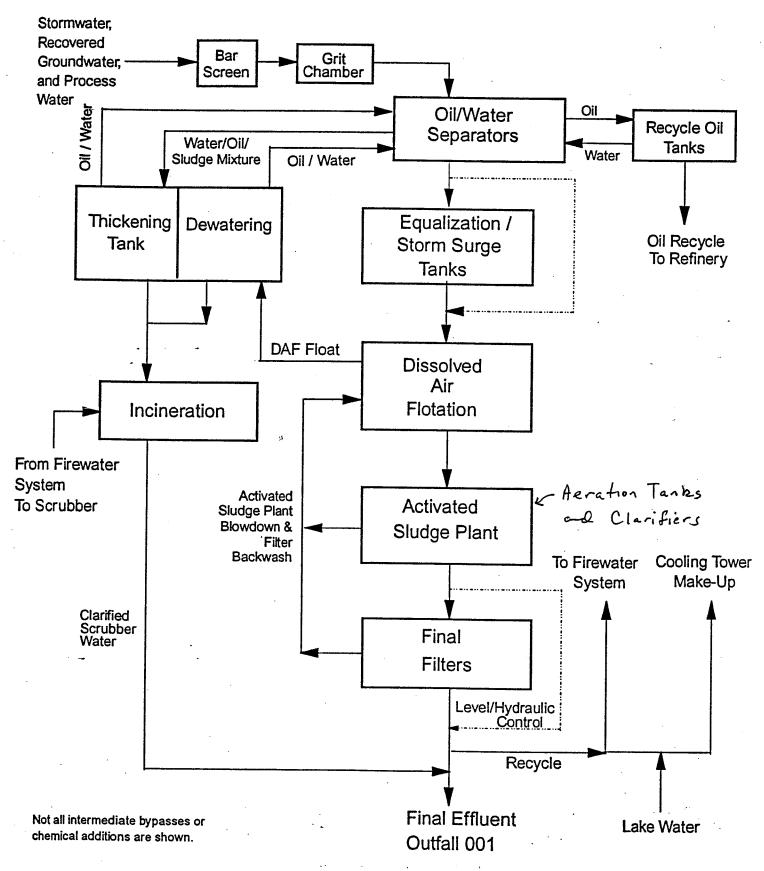
Environmental, Health and Safety

Putu B. Berens

Team Leader - Water

Attachment

Wastewater Treatment Plant - Water Flow Diagram Amoco Oil Company - Whiting Refinery

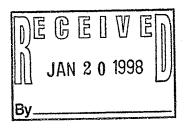




Via Certified Mail No. Z 441 009 268 Return Receipt Requested

January 14, 1998

Mr. Steven Judeth
Office of Enforcement
Indiana Department of Environmental Management
100 North Senate Avenue
P.O. Box 6015
Indianapolis, Indiana 46206-6015



Subject:

Amoco Oil Company and Amoco Pipeline Company, Cause No. B-1545,

Free Phase Xylene Recovery - 4th Quarter 1997 Report

Dear Mr. Judeth:

Woodward-Clyde International-Americas (WCIA), on behalf of Amoco Pipeline Company, submits this free phase xylene (FPX) quarterly report for the Amoco Pipeline Xylene Site located at 129th Street and Calumet Avenue in Hammond Indiana. This quarterly report is for the period from August 28, 1997 through December 4, 1997.

The previous quarterly report dated August 28, 1997 included information collected from the site between June 4, 1997 and August 28, 1997.

Groundwater Elevations

WCIA performed fluid level measurements on December 4, 1997 in site monitoring wells and selected wellpoints. The depth to product and depth to groundwater were measured at each location. The field measurements and corrected groundwater elevations are presented in Table 1. The groundwater elevations are depressed between the wellpoint system and the xylene pumphouse due to pumping of groundwater by the wellpoint system.

FPX Thickness

Table 1 also presents the corrected FPX thickness for the wells and wellpoints for December 4, 1997. The FPX thickness has been corrected based on the specific gravity value of xylene (0.86).



Mr. Steven Judeth Indiana Department of Environmental Management January 14, 1998 Page 2

The formula used to correct the FPX thickness is presented below:

 $FPX_c = FPX_m * ((1-SG) / SG)$ where:

 $FPX_c = corrected FPX \text{ thickness}; FPX_m = measured FPX \text{ thickness}; and SG = specific gravity of FPX$

Figures 1 and 2 present the extent of corrected FPX thickness at the site on August 28 and December 4, 1997, respectively. The volume of FPX present was calculated using the average thickness of FPX between each contour line assuming a porosity of 0.30 for fine to medium sand (Applied Hydrogeology, Fetter, 1980). The volume of FPX in the soil was calculated using a methodology that is consistent with other Amoco Whiting projects. The calculated volumes are a best estimate of FPX in the ground and can be influenced by site conditions including varying groundwater elevations and FPX buildup around remediation systems. This information is best used to evaluate long-term trends of FPX volumes.

The approximate volume of FPX present at the site on December 4, 1997 was 14,900 gallons. Increases of FPX thickness from August 28 to December 4 were measured at wells PZX-2, JLV014, JLV015, and JLV034 which are located along the wellpoint system. FPH thickness also increased at wells PZX-5, PZX-7, and PZX-8 which are located between the wellpoints and the pumphouse.

FPX decreased along the northern wellpoint leg at PZX-3 and along the western wellpoint leg at JLV001 and at well JLM029.

Recovery System

The J-162 recovery system is inspected weekly by the Whiting Environmental Inspector (EI). The recovery system includes 34 well points and vacuum recovery devices (VRDs). The recovery well, RWX-1, has a VRD in it and is not used for pumping groundwater. The weekly activities of the EI include recording the total flow of the system and collecting a sample of groundwater from the system for measurement of percent hydrocarbon emulsion in a graduated cylinder.

During this quarter, the system recovered approximately 4,345,679 gallons of groundwater containing dissolved phase xylenes and FPX. The total amount of fluids recovered in 1997 through December 1 was approximately 16 million gallons and is presented graphically on Figure 3. The weekly average flow of fluid recovery from January through December 1 was approximately 33 gallons per minute and is presented in Figure 4. The hydrocarbon emulsion

Woodward-Clyge

Mr. Steven Judeth Indiana Department of Environmental Management January 14, 1998 Page 3

values for the fourth quarter of 1997 ranged from 0 to 1 percent and are presented graphically in Figure 5.

Groundwater Sampling

Groundwater samples will be collected quarterly from well JLM032 and analyzed for xylenes. Well JLM032 was sampled on December 10, 1997 and a concentration of 15 mg/L of xylenes was detected. The certificate of analysis for well JLM032 is attached to this report.

The concentrations of xylenes in groundwater samples may fluctuate due to seasonal variations in groundwater elevations, as well as the amount of precipitation. The groundwater elevations for well JLM032 from 1996 through this reporting period are presented in a graph on Figure 6. The xylene concentrations are expected to reduce over time as a result of attenuation and recovery of FPX. Amoco is studying alternatives to evaluate the detected concentrations of dissolved xylenes at well JLM032.

If you have any questions regarding this report please call either of the undersigned at (312) 939-1000.

Sincerely,

Laurence F. Verkoulen

Laurence Vertoulen

Assistant Project Manager

Timothy M. Black Project Manager

Attachments

cc:

Mark W. Stanifer

D. Beckmann (Amoco)

K. Fase (Amoco)

L. Malnor (Amoco)

K. Sprague (Amoco)

C.K. Yukawa (WCIA)

S. Hutts (HDEM) via Certified Mail No. Z 441 009 269

File

AUGUST 28, 1997 AND DECEMBER 4,1997 FLUID LEVEL MEASUREMENTS
AMOCO PIPELINE XYLENE AREA
AMOCO OIL COMPANY
HAMMOND, INDIANA TABLE 1

	_	~	_	-	_	_	_	1	_	_	_	- 1	_	_		_	_	_	_	_	7	_	_	-	_	1	1		_	Т	_	7
	CORRECTED	FPX	SOUND OF THE PERSON OF THE PER	0.31	20.0	0.62		0.19	0.16	0.75	0.30	0.10	0.35	1.74	0.56	0.42	0.12		0.00		0.37	0.16		0.02		0.15		0.26			0.14	0.07
r 4, 1997		DEPTH TO	\ <u>\</u>	5.56	2.38	3.73	Ω	7.18	8.53	5.50	6.17	5.07	6.29	6.24	8.35	9.34	8.86	ΣZ	Q	ΣZ	8.54	6.88	ΣZ	7.29	∑	7.53	ΣN	7.39	ZZ Z	Σ Z	6.54	10.45
December 4, 1997	CORRECTED	GW GW	ELEVATION 530 94	5/9.81	582.31	580.58	579.94	580.72	579.50	581.39	579.00	578.59	578.87	577.26	579.31	NA	ΝΑ	MΖ	NA	MN	NA	Ϋ́	ΣN	NA	MN	Ϋ́	ΝM	Ϋ́	ΣZ	ΣZ	NA	AN A
		DEPTH TO	۸ _ا	7.47	2.78	7.54	3.71	8.32	9.49	10.08	8.02	5.70	8.44	16.92	11.82	11.90	9.58	NM	9.08	MN	10.79	7.84	ΣZ	7.41	WN	8.43	MΝ	8.96	ΣZ	ΣZ	7.41	10.91
	CORRECTED	FPX Tillogoiroo2	THICKNESS.	0.50	0.03	1.56	00'0	0.60	0.08	0.90	0.28	0.07	0.50	1.52	0.44	0.87		0:30		0.00	0.03	0.06	0.13		0.05		0.12		MM	0.11	0.09	NZ
8, 1997		DEPTH TO	Ă	5.25	2.36	2.99	Q	6.71	8.70	5.60	5.91	5.10	6.32	7.02	8.73	9.43	MΝ	10.43	ΣZ	Q	9.13	7.29	6.01	WN	7.21	MΝ	7.32	MΝ	ΨN	8.22	7.23	NM
August 28, 1997	CORRECTED	OW.	ELEVATION:	579.96	582.36	580.51	581.78	580.83	579.39	581.16	579,28	578.59	578.71	576.67	579.04	ΑΝ	ΜZ	Ą	NN.	Ϋ́Α	ΑN	NA	NA	NM	NA	ΝZ	N A A	ΝŽ	Ϋ́	ΝA	ΨN	ΨN
		DEPTH TO	δW	8.35	2.57	12.59	1.87	10.40	9.18	11.11	7.63	5.50	9.38	16.38	11.45	14.75	ΣZ	12.30	ΣZ	8.93	9.34	7.63	6.83	ΣŽ	7.52	ΜN	8.04	ΣZ	ΣZ	8.89	77.7	ΝZ
		TOTAL	DEPTH	12.68	13.57	15.80	15.23	16.73	19.48	18.36	16.83	16.11	17.95	17.28	18.22	Ϋ́	Ϋ́	Ϋ́	ΝΑΝ	Υ Z	Ϋ́Z	AN	ΑN	ΨN	ΑN	ΨN	ΑN	Ä	ΑN	ΑN	ΑN	ΑN
	TOP OF	ELEVATION,	NGVD FT	585.64	584.75	584.84	583,65	588.06	588,16	587,53	585.43	583.75	585.46	585.00	588.15	AN	Ϋ́	Ą	AN	NA AN	Ą	¥	NA	¥	Ą	NA A	¥	AA	ΑN	ΑΝ	ΑN	ΑN
			LOCATION	JLM029	JLM030	J. M031	JL M032	PZX-1	PZX-2	PZX-3	PZX-4	PZX-5	9-XZ-G	7-X-Z	P7X-8	# VOO1	JI V004	.II V005	II VOOR	.II V010	.II V014	JI V015	JLV016	JLV019	.II V020	JL V024	JI V026	JLV029	JLV030	JLV032	JLV034	RWX-1

NOTES:

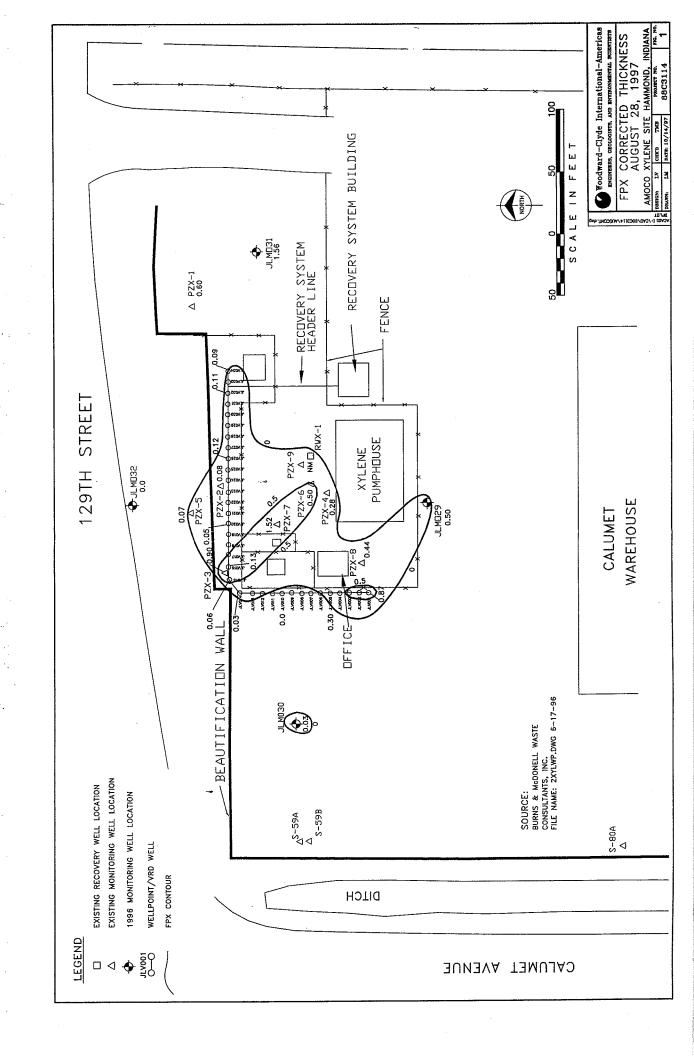
All measurements are in feet.

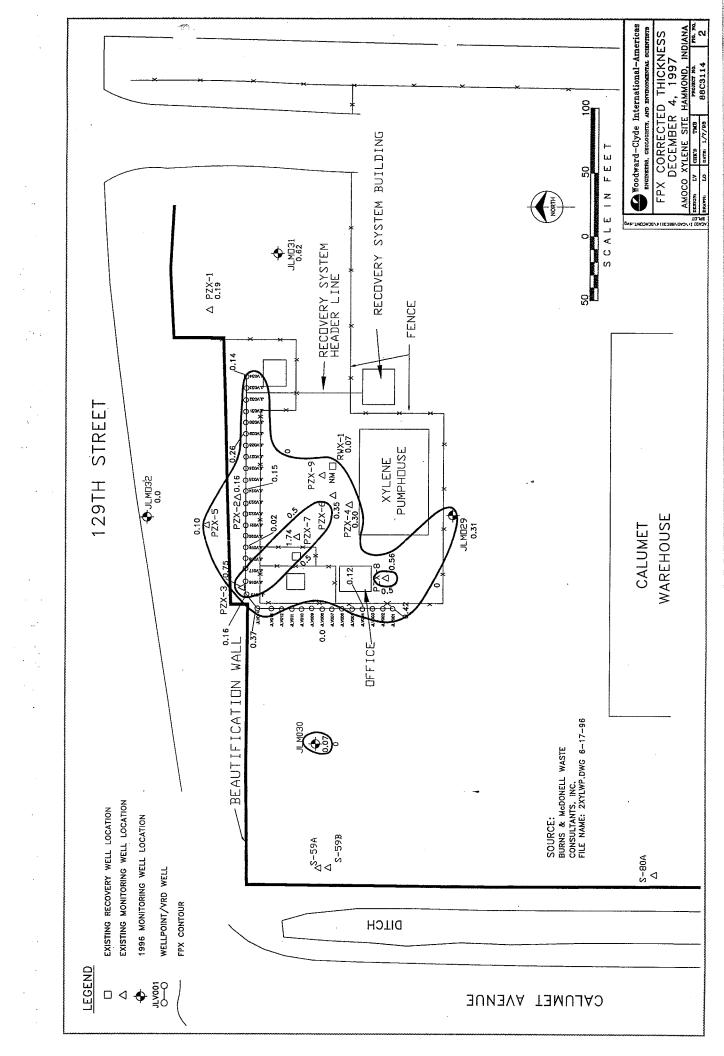
ND Not detected NM Not measured

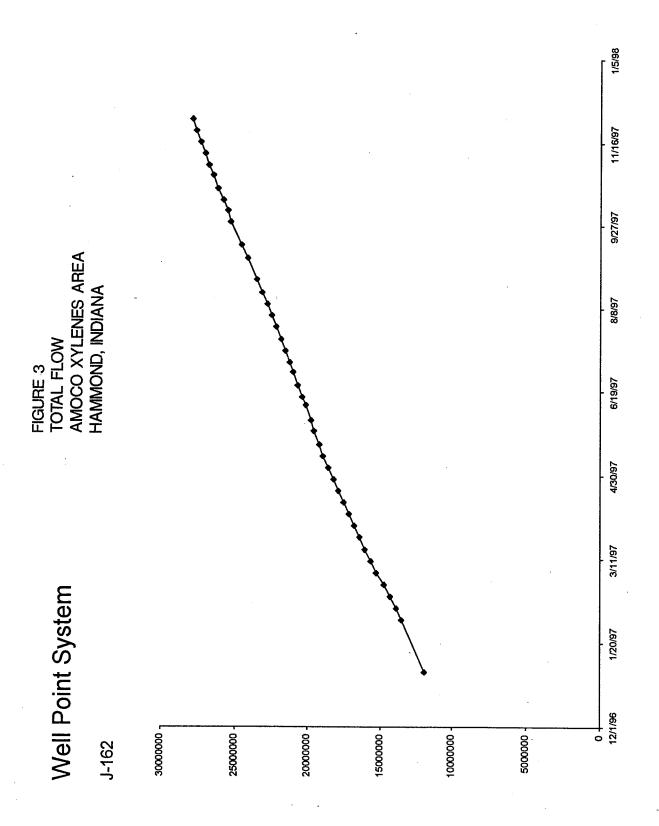
NA The surveyed elevations and total depths for the JLV well points are not available. The total depths are approximately 16 feet. FPX Free Phase Xylenes

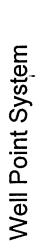
If FPX was detected the groundwater elevations were corrected according to the following formula: $GW_c = GW_m * (SG + (FPX_m))$ where $GW_c =$ corrected groundwater elevation, $GW_m =$ measured

groundwater elevation, SG = specific gravity of free phase xylenes, and FPX_m= measured thickness of FPX. ²Corrected free phase xylenes thickness in the formation was calculated according to the following formula: FPX_e = FPX_m * ((1-SG) / SG) where FPX_e = corrected free phase xylenes thickness, FPX_m = measured free phase xylenes



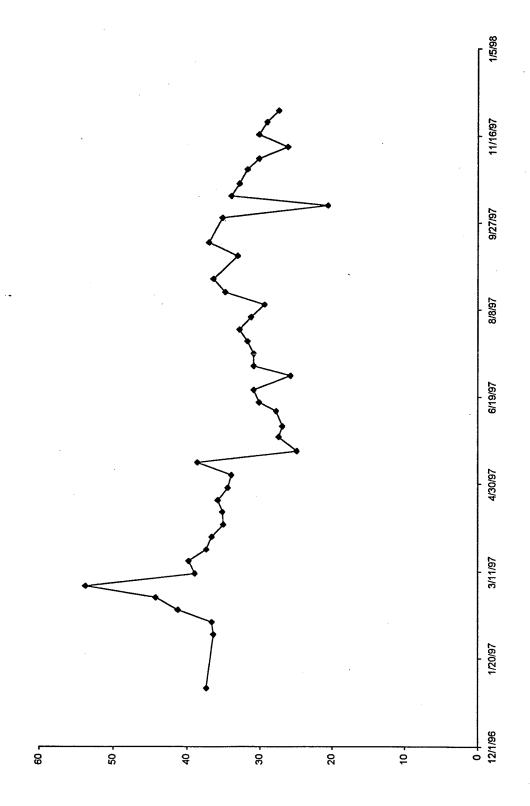






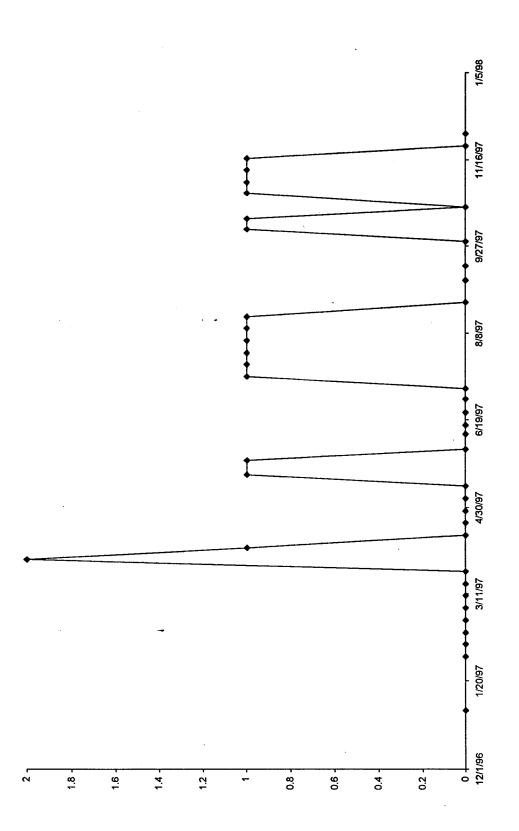
J-162





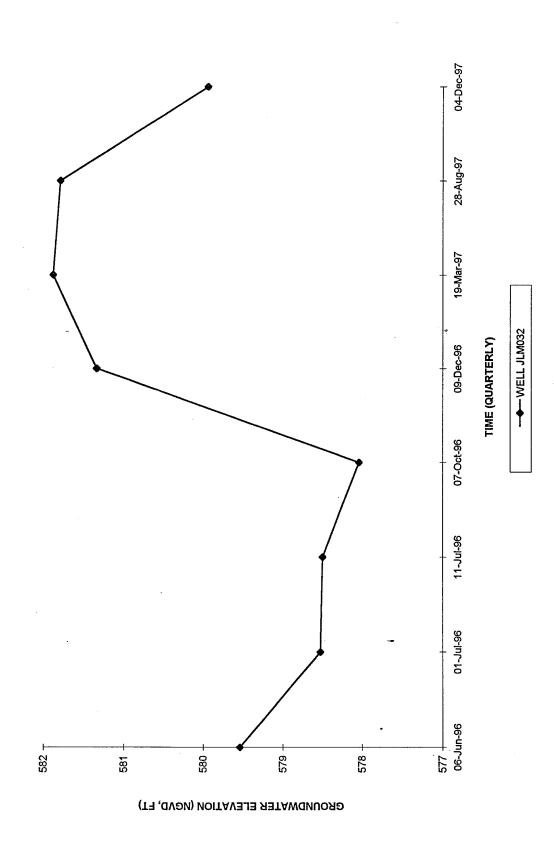






I:88C3114\XYLENE\1997\4Q

FIGURE 6
1996 AND 1997 GROUNDWATER ELEVATIONS AT WELL JLM032
AMOCO PIPELINE XYLENE AREA
AMOCO OIL COMPANY, HAMMOND, INDIANA



Client: Woodward-Clyde Consultants

Project ID: 88C3114-X002 Site: WHITING

Client Specific Compound List GCMS Volatiles Analysis

Lab Sample Number: L72972923-001 Method: 8260
Client ID: JLM032 Matrix: WATER



HAMMOND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

CITY OF HAMMOND, INDIANA 46320

5925 CALUMET AVENUE

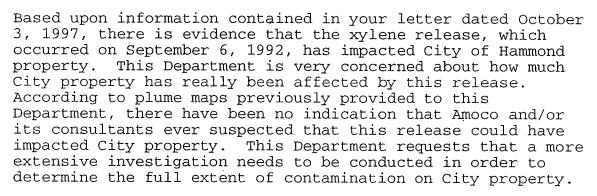
PHONE (219) 853-6306 FAX (219) 853-6343

October 8, 1997

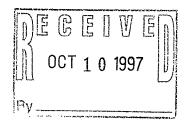
Timothy M. Black, Senior Project Hydrogeologist Woodward-Clyde International 122 South Michigan Avenue, Suite 1920 Chicago, Illinois 60603 Certified Mail #Z 741 651 894

RE: Calumet Avenue Xylene Site

Dear Mr. Black:



Furthermore, after reviewing this Department's files, it has been found that a License Agreement has not been signed between Woodward-Clyde and the City of Hammond. This License Agreement would grant permission to Woodward-Clyde to continue monitoring this well. This Department is therefore enclosing a License Agreement which needs to be signed by both Woodward-Clyde and Amoco and returned to this Department. A provision has been added to this License Agreement which will require quarterly monitoring of this well and any additional wells that will be placed on City property in order to determine the full extent of contamination. This License Agreement will then be forwarded to the Board of Public Works and Safety for their approval and signatures.



If you have any questions or comments, please feel free to contact me.

Sincerely,

Sue A. Hutts, Inspector

Hammond Department of Environmental Management

Enclsoure

cc: Larry Malnor, Amoço

Kevin Sprague, Amoco

Steven Judith, IDEM - OE

LICENSE AGREEMENT

This License Agreement is entered into between Amoco Oil Company, 2021 Spring Road, Suite 400, Oakbrook, Illinois 60521, and the Civil City of Hammond, Indiana. The purpose of this License Agreement is to provide Amoco Oil Company and its representative, Woodward-Clyde access to City property located directly adjacent to 2939 Calumet Avenue, Hammond, Indiana ("property"), in order to install additional monitoring wells and sample these wells adjacent to the above referenced location. The City property covered by this Agreement is described on a map which is attached as Exhibit "A" to this License Agreement. The License Agreement is made subject to the conditions set forth below.

I. ACCESS

- 1. Amoco Oil Company and its representative, Woodward-Clyde shall have access to the property for undertaking and conducting activities covered by this Agreement.
- 2. Amoco Oil Company and its representative, Woodward-Clyde shall conduct its activities on the property in a manner that will not interfere with any City operations being conducted on the property.

II. SCOPE OF LICENSE

This License Agreement gives Amoco Oil Company and its representative, Woodward-Clyde the right to enter onto the property for the following purposes:

- Assessing soil, surface water, and groundwater contamination;
- 2. Extracting samples from the soil, surface water or groundwater; and
- 3. Performing other related monitoring activities.

III. SITE ASSESSMENT

1. Amoco Oil Company and its representative, Woodward-Clyde shall conduct quarterly sampling events on all monitoring wells located on City of Hammond property.

- 2. Amoco Oil Company and its representative, Woodward-Clyde shall provide, all sampling to the Hammond Department of Environmental Management or its designated representative within five (5) business days after receipt from the lab.
- 3. Amoco Oil Company and its representative, Woodward-Clyde shall give reasonable notice prior to the installation or removal of any monitoring wells or the initiation of any monitoring activities.

IV. MATERIALS REMOVED FROM SITE

Any samples, waste materials, soil cuttings, hazardous wastes, hazardous substances, pollutants, contaminants, or free product which results from activities conducted under this Agreement shall be the sole property of Amoco Oil Company and shall be handled, stored, treated, transported, and disposed of, as necessary, in accordance with all applicable local, state, and federal laws, regulations, and ordinances.

V. TOOLS AND EQUIPMENT

All tools, equipment or other property placed upon the property by Amoco Oil Company or its representative, Woodward-Clyde shall remain the property of Amoco Oil Company or its representative, Woodward-Clyde and shall be removed immediately after the expiration of this Agreement.

VI. SITE CONDITION

Amoco Oil Company and its representative, Woodward-Clyde shall conduct its activities in a manner so as to minimize the disturbance to existing site conditions. Any disturbance to the property resulting from Amoco Oil Company and its representative, Woodward-Clyde activities shall be repaired or corrected promptly. Amoco Oil Company or its representative, Woodward-Clyde shall pave and/or provide appropriate landscaping so as to restore the property to its original condition.

VII. INDEMNIFICATION AGREEMENT

- 1. Amoco Oil Company and its representative, Woodward-Clyde will indemnify and hold harmless the Civil City of Hammond, Indiana from all actions, claims, demands, liabilities, and damages which may be imposed on or incurred by the Civil City of Hammond, Indiana as a consequence of any negligent or intentional act or omission on the part of Amoco Oil Company and its representative, Woodward-Clyde, or anyone acting on behalf of Amoco Oil Company and its representative, Woodward-Clyde, in the exercise of its rights under this License Agreement.
- 2. In the performance of its obligation hereunder, Amoco Oil Company and its representative, Woodward-Clyde will observe any and all local, state, and federal safety, health, and environmental regulations which may be applicable. Amoco Oil Company and its representative, Woodward-Clyde will indemnify and hold harmless the Civil City of Hammond, Indiana from all actions, claims, demands, liabilities, and damages that may be imposed as a result of Amoco Oil Company and its representative, Woodward-Clyde failure to observe any applicable safety, health, and environmental regulations.

VIII. GOVERNING LAW

The law of the State of Indiana shall apply to the interpretation of this License Agreement and to the resolution of any disputes arising out of the matter set forth herein.

IX. TERM OF LICENSE AGREEMENT

This License Agreement shall be effective on _____ and shall continue in effect until Woodward-Clyde completes the requisite assessment or one (1) year from the effective date of this License Agreement whichever occurs first.

X. TERMINATION OF LICENSE AGREEMENT

Either party may terminate this License Agreement prior to the expiration of the term set forth in Section IX above if the other party violates any condition of the License Agreement. Any termination thereunder shall be effective thirty (30) days after written notification to the other party.

XI. ASSIGNABILITY

This License Agreement is not assignable.

XII. STIPULATED PENALTIES

Amoco Oil Company and its representative, Woodward-Clyde agrees to pay a penalty of Two Thousand Dollars (\$2,000.00) per day, per violation, until the violation is corrected, should any of the terms of this agreement be breached by it, or its representative, Woodward-Clyde.

	AMOCO OIL COMPANY	HAMMOND BOARD OF PUBLIC WORKS AND SAFETY
By:		
Title:		
Printed Name:		
	WOODWARD-CLYDE	
By:		
Title:		
Printed Name:		





Amoco Petroleum Products Refining Business Group Whiting Business Unit

2815 Indianapolis Boulevard Post Office Box 710 Whiting Indiana 46394-0710 219-473-7700

CERTIFIED MAIL RETURN RECEIPT REQUESTED

August 4, 1997

Mr. Gary Starks
Indiana Department of Environmental Management
Office of Water Management
105 South Meridian Street
Indianapolis, IN 46206-6015

Dear Mr. Starks:

NPDES Permit No. IN 0000108 <u>Discharge of Monoethanolamine (MEA) at Outfall 002</u>

This letter serves as a follow-up to our initial notification to you on July 29, 1997, concerning a discharge of MEA at Outfall 002 on July 28, 1997. Outfall 002 serves as the discharge point for non-contact (once-through) cooling water. The net daily maximum limit in our permit for Total Organic Carbon (TOC) is 5.0 mg/l. Based on three grab samples, the average TOC was 81 mg/l for approximately 5 hours and 45 minutes beginning at approximately 15:30. The daily grab sample taken that morning showed TOC intake at 2.0 mg/l and TOC discharge at 2.0 mg/l. To our knowledge there were no adverse environmental consequences. MEA is practically non-toxic at concentrations up to 1000 ppm as noted in the MSDS (attached).

The MEA discharge resulted from a leaking MEA cooler in the once-through cooling water (OTCW) system. During routine operations at approximately 14:00, the E-367A MEA cooler was taken out of service and the E-367B MEA cooler was put in service. E-367B had been previously tested, blinded, and placed on standby. At approximately 15:30, a discoloration was observed in the OTCW system and discharge. Immediately, investigation into potential sources began refinery-wide. Initially, the source was believed to be a leak from E-367A just prior to being taken out of service. Observations of the OTCW system upstream of the outfall discharge appeared to confirm this conclusion (as the discoloration appeared to lessen). However, subsequent results based on TOC analysis of upstream samples indicated contamination due to E-367B, and work began immediately to remove it from service.

August 4, 1997 Mr. Gary Starks Page 2

The following agency notifications were made on July 28:

16:05 -- IDEM, Tom Mattox, Incident # 9707202

16:20 -- US Coast Guard, Petty Officer Sly

17:00 -- US Coast Guard, Petty Officer Grubbs

Follow-up with IDEM (Ralph McCullers) and US Coast Guard (Petty Officer Grubbs) occurred the morning of July 29.

Although the source of the leak was difficult to determine initially, the observation and sampling efforts immediately undertaken to locate the source were successful in identifying and removing the leaking cooler from the system. Emergency options to quickly mitigate the discharge once the source was known were evaluated. The safest and most effective environmental solution of removing the E-367B cooler from service and reconnecting the E-367A cooler was selected. We are implementing mechanisms to reduce the likelihood of a recurrence of such an event. We have already instituted a change in the start-up procedure to include testing and monitoring for these coolers just prior to and during start-up. We are also upgrading the metallurgy on the cooler bundle as an additional safeguard.

If you have questions or need additional information, please contact me at (219)473-3459, or Shiv Baloo at (219)473-3740.

Mark E. Webster

Environmental Engineer, Water

hal Est) lotte

cc: Petty Officer Grubbs

Marine Safety Office, Chicago United States Coast Guard

MATERIAL SAFETY DATA SHEET

HUNTSMAN

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

PRODUCT CODE AND NAME: MEA MONOETHANOLAMINE, MEA

 DATE ISSUED
 : 5/1/96

 DATE PRINTED
 : 9/19/96

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

PRODUCT CODE AND NAME

MEA MONOETHANOLAMINE, MEA

Chemical Name and/or Family or Description:

Alkanolamine

COMPANY INFORMATION

Huntsman Petrochemical Corporation P.O. Box 27707 Houston, TX 77227-7707

TELEPHONE NUMBERS
Transportation Emergency

Company: (409) 727-0831 CHEMTREC: (800) 424-9300

Medical Emergency: (409) 722-9673 (24 Hour) General MSDS Assistance: (713) 235-6432 Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION IS AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION. Product and/or Component(s) Carcinogenic According to:

OSHA IARC NTP OTHER NONEX

Composition:

Chemical Name

CAS Number

Exposure Limits

Range in %

100

Ethanol, 2-amino-

141-43-5

6 ppm STEL-ACGIH

3 ppm TWA-OSHA

6 ppm STEL-OSHA

3 ppm TWA-ACGIH

THIS PRODUCT IS CONSIDERED HAZARDOUS ACCORDING TO OSHA (1910.1200).

1

PRODUCT CODE AND NAME

: MEA

MONOETHANOLAWINE, MEA

DATE ISSUED
DATE PRINTED

: 5/1/96 : 9/19/96

COMPANY

: HUNTSMAN PETROCHEMICAL CORPORATION

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Clear liquid

Odor:

Ammonia-like odor

WARNING STATEMENT

DANGER!

CORROSIVE - CAUSES EYE AND SKIN BURNS

HARMFUL OR FATAL IF SWALLOWED
MAY CAUSE DIZZINESS AND DROWSINESS

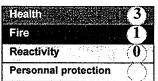
CAUSES RESPIRATORY TRACT IRRITATION AND CAN CAUSE

DAMAGE

ASPIRATION HAZARD IF SWALLOWED - CAN ENTER LUNGS AND CAUSE DAMAGE

MAY CAUSE LIVER AND KIDNEY DAMAGE BASED ON ANIMAL DATA

Hazardous Material Information System (United States)



National Fire
Protection Association
NFPA (United States)
Health



POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye X Skin X Inhalation X Ingestion

Effects of Overexposure

Acute:

Eyes:

Causes irritation, experienced as pain, with excess blinking and tear production, and seen as extreme redness and swelling of the eye and chemical burns of the eye.

Severe eye damage may cause blindness.

Skin:

Causes severe irritation with pain, severe excess redness and swelling with chemical burns, blister formation, and possible tissue destruction. Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects, below, and Section 11 for

information regarding potential long term effects.

Inhalation:

Vapors or mist, especially as generated from heating the material or as from exposure in poorly ventilated areas or confined spaces, are irritating and cause nasal discharge, coughing, and discomfort in nose and throat. Prolonged or repeated overexposure may result in lung damage. Inhalation may cause dizziness, drowsiness, euphoria, loss of coordination, disorientation, headache, nausea, and vomiting. In poorly ventilated areas or confined spaces, unconsciousness and asphyxiation may result. Prolonged or repeated overexposure may result in the

absorption of potentially harmful amounts of material.

Ingestion:

Causes burning of mouth, throat, and stomach with abdominal and chest pain, nausea, vomiting, diarrhea, thirst, weakness, and collapse. Aspiration may occur

during swallowing or vomiting, resulting in lung damage.

PRODUCT CODE AND NAM

: MEA

MONOETHANOLA NE, MEA

DATE ISSUED

5/1/96

DATE PRINTED

9/19/96

COMPANY

: HUNTSMAN PETROCHEMICAL CORPORATION

Sensitization Properties: Unknown

Chronic:

Repeated skin contact may cause a persistent irritation or dermatitis. Repeated inhalation may cause lung damage.

Medical Conditions Aggravated by Exposure:

Skin contact may aggravate an existing dermatitis (skin condition). Overexposure to vapor, dust or mist may aggravate existing respiratory conditions, such as asthma, bronchitis, and inflammatory or fibrotic respiratory disease. Repeated overexposure may aggravate existing liver or kidney disease.

Other Remarks:

This product contains one or more amines which may produce temporary and reversible hazy or blurred vision. Symptoms disappear when exposure is terminated.

4. FIRST AID MEASURES

Eyes:

Immediately flush eyes with large amounts of running water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Do not attempt to neutralize with chemical agents. Obtain medical attention immediately. Continue flushing for an additional 15 minutes if medical attention is not immediately available.

Skin:

Immediately remove contaminated clothing and shoes. Under a safety shower, flush skin thoroughly with large amounts of running water for at least 15 minutes. Do not attempt to neutralize with chemical agents. Get medical attention immediately. Discard or decontaminate clothing and shoes before reuse.

Ingestion:

If person is conscious and can swallow, immediately give two glasses of water (16 oz.) but do not induce vomiting. This material is corrosive. If vomiting occurs, give fluids again. Have a physician determine if condition of patient will permit induction of vomiting or evacuation of stomach. Do not give anything by mouth to an unconscious or convulsing person.

Inhalation:

If inhaled, remove to fresh air. If not breathing or in respiratory distress, clear person's airway and start artificial respiration. With a physician's advice, give supplemental oxygen using a bag-valve mask or manually triggered oxygen supply.

Other Instructions:

Swallowing of this corrosive material may result in severe ulceration, inflammation, and possible perforation of the upper alimentary tract, with hemorrhage and fluid loss. Aspiration of this product during induced emesis can result in severe lung injury. If evacuation of stomach is necessary, use method least likely to cause aspiration, such as gastric lavage after endotracheal intubation. Contact a Poison Control Center for additional treatment information.

Remove and dry-clean or launder clothing soaked or soiled with this material before reuse. Dry cleaning of contaminated clothing may be more effective than normal laundering. Inform individuals responsible for cleaning of potential hazards associated with handling contaminated clothing.

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

Not determined.

Flash Point (degrees C):

95.5 (204 F) (PMCC)

Flammable Limits % (Lower-Upper):

Lower: 5 Upper: 17 PRODUCT CODE AND NAME

MEA

MONOETHANOLAMINE, MEA

DATE ISSUED

: 5/1/96

DATE PRINTED

: 9/19/96

COMPANY

: HUNTSMAN PETROCHEMICAL CORPORATION

Recommended Fire Extinguishing Agents And Special Procedures:

Use water spray, dry chemical, foam, or carbon dioxide to extinguish flames. Use water spray to cool fire-exposed containers. Water or foam may cause frothing.

Unusual or Explosive Hazards:

None

Special Protective Equipment for Firefighters:

Wear special chemical protective clothing and positive pressure self-contained breathing apparatus. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Decontaminate or discard any clothing that may contain chemical residues.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Ventilate area. Avoid breathing vapor. Wear appropriate personal protective equipment, including appropriate respiratory protection. Contain spill if possible. Wipe up or absorb on suitable material and shovel up. Prevent entry into sewers and waterways. Avoid contact with skin, eyes or clothing.

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Minimum feasible handling temperatures should be maintained. Eye wash and safety shower should be available nearby when this product is handled or used.

Storage:

Periods of exposure to high temperatures should be minimized. Water contamination should be avoided.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Avoid eye contact. Chemical type goggles with face shield must be worn. Do not wear contact lenses.

Skin Protection:

Protective clothing such as coveralls or lab coats must be worn. Launder or dry-clean when soiled. Gloves resistant to chemicals and petroleum distillates required. When handling large quantities, impervious suits, gloves, and rubber boots must be worn.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Adequate to meet occupational exposure limits (see below).

Exposure Limit for the Total Product:

PRODUCT CODE AND NAM.

MEA

MONOETHANOLA NE, MEA

DATE ISSUED DATE PRINTED 5/1/96 9/19/96

COMPANY

HUNTSMAN PETROCHEMICAL CORPORATION

Monoethanolamine (ethanolamine): OSHA PEL-TWA 3.0 ppm; STEL 6.0 ppm

ACGIH TLV-TWA 3.0

ppm; STEL 6.0 ppm

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Clear liquid

Odor:

Ammonia-like odor

Boiling Point (degrees C):

170.5 (339 F)

Melting/Freezing Point (degrees C):

10.5 (51 F)

Specific Gravity (water=1):

1.02

pH:

11.8

Vapor Pressure:

.2 mmHg at 20 C (68 F)

Viscosity:

23.6 cSt at 20 C (68 F)

VOC Content:

Not Determined

Vapor Density (Air=1):

Solubility in Water (%):

>10

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air Water Heat Strong Oxidizers Others X None of these

Comments:

This material reacts violently with acids.

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of ammonia, combustion products of nitrogen, carbon monoxide, carbon dioxide, irritating aldehydes and ketones may be formed on burning in a limited air supply.

Hazardous Polymerizations:

DO NOT OCCUR

PRODUCT CODE AND NAME : MEA MONOETHANOLAMINE, MEA

 DATE ISSUED
 : 5/1/96

 DATE PRINTED
 : 9/19/96

COMPANY : HUNTSMAN PETROCHEMICAL CORPORATION

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:

LD50 Believed to be > 1.00 - 2.00 g/kg (rat) moderately toxic

Inhalation:

Not determined.

Dermal:

LD50 1.00 g/kg (rabbit) slightly toxic

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin

(Draize) Believed to be > 6.50 - 8.00 /8.0 (rabbit) corrosive

Eyes:

(Draize) Believed to be > 80.00 - 110.00 /110 (rabbit) extremely irritating

Sensitization: Not determined.

Other:

Prolonged and repeated ingestion of monoethanolamine has caused kidney and liver damage in laboratory animals. In addition, a developmental toxicity study, using unconventional statistical treatment of the data, demonstrated developmental toxicity in rats. The true signifigance of the study data is not clear, since a full reinterpretation of this data is not possible at this time. Additional or repeat studies are planned or underway to better define the toxic potential of this product, or to verify the results obtained from previous animal studies.

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product has been evaluated for RCRA characteristics and does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may render the resulting materials hazardous.

Remarks:

None

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:

Ethanolamine

Hazard Class:

8

Identification Number:

UN 2491

Packing Group:

Ш

Label Required:

Corrosive

IMDG

Proper Shipping Name:

PRODUCT CODE AND NAIL

MEA

MONOETHANOL NE, MEA

DATE ISSUED DATE PRINTED 5/1/96

COMPANY

9/19/96

HUNTSMAN PETROCHEMICAL CORPORATION

Not evaluated

ICAO

Proper Shipping Name:

Not evaluated

TDG

Proper Shipping Name:

Ethanolamine

Hazard Class:

8

Identification Number:

UN 2491

Label Required:

Corrosive

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name

CAS Number Range in % **TPQ** RQ

None.

Section 311 Hazardous Categorization:

Acute X Chronic X Fire

Pressure Reactive N/A

Section 313 Toxic Chemical

Chemical Name

CAS

Concentration

Number

None.

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name

CAS Number

Range in %

RQ

None.

States Right-to-Know Regulations:

Chemical Name

State Right-to-know

Ethanol, 2-amino-

CT, FL, IL, MA, NJ, PA, RI

State list: CT (Connecticut), FL (Florida), IL (Illinois), MI (Michigan), LA (Louisiana), MA (Massachusetts), NJ (New Jersey), PA (Pennsylvania), RI (Rhode Island)

California Prop. 65:

The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name

CAS

Number

None.

INTERNATIONAL REGULATIONS:

PRODUCT CODE AND NAME

MEA

MONOETHANOLAMINE, MEA

DATE ISSUED
DATE PRINTED

5/1/96 9/19/96

COMPANY

HUNTSMAN PETROCHEMICAL CORPORATION

TSCA Inventory Status:

This product, or its components, are listed on or are exempt from the the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:

Class E: Corrosive

Canadian Inventory Status:

This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:

This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:

This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:

This product, or its components, are listed on or are exempt from the Japan Ministry of International Trade and Industry (MITI) inventory.

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

LC50-96hr Aquatic toxicity rating is > 100.00 - 1000.00 ppm practically non-toxic

Mobility:

Not determined.

Persistence and Biodegradability:

Not determined.

Potential to Bioaccumulate:

Not determined.

Remarks:

None

16. OTHER INFORMATION 5/1/96

None

THE INFORMATION CONTAINED HEREIN IS BELIEVED TO BE ACCURATE. IT IS PROVIDED INDEPENDENTLY OF ANY SALE OF THE PRODUCT FOR PURPOSE OF HAZARD COMMUNICATION AS PART OF HUNTSMAN'S PRODUCT SAFETY PROGRAM. IT IS NOT INTENDED TO CONSTITUTE PERFORMANCE INFORMATION CONCERNING THE PRODUCT. NO EXPRESS WARRANTY, OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE IS MADE WITH RESPECT TO THE PRODUCT OR THE INFORMATION CONTAINED HEREIN. DATA SHEETS ARE AVAILABLE FOR ALL HUNTSMAN PRODUCTS. YOU ARE URGED TO OBTAIN DATA SHEETS FOR ALL HUNTSMAN PRODUCTS YOU BUY, PROCESS, USE OR DISTRIBUTE AND YOU ARE ENCOURAGED AND REQUESTED TO ADVISE THOSE WHO MAY COME IN CONTACT WITH SUCH PRODUCTS OF THE INFORMATION CONTAINED HEREIN.

TO DETERMINE APPLICABILITY OR EFFECTS OF ANY LAW OR REGULATION WITH RESPECT TO THE PRODUCT, USER SHOULD CONSULT HIS LEGAL ADVISOR OR THE APPROPRIATE GOVERNMENT AGENCY. HUNTSMAN DOES NOT UNDERTAKE TO FURNISH ADVICE ON SUCH MATTERS.

PRODUCT CODE AND NAM

MEA

MONOETHANOLA NE, MEA

DATE ISSUED DATE PRINTED 5/1/96

9/19/96

COMPANY

HUNTSMAN PETROCHEMICAL CORPORATION

Date Issued: 5/1/96.

Verified by Phillip B. Valkovich.

Inquiries regarding MSDS should be directed to:

Huntsman Petrochemical Corporation

Coordinator, Product Safety

P.O. Box 27707

Houston, TX 77227-7707

PHONE NO. : 3172435036

p- File/cop. P01

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT OFFICE OF WATER MANAGEMENT, INSPECTION SECTION

COMPLAINT REPORT FORM

_			
Δ	Com	·mi	178

Date Reported: June 18, 1995

Received by : ELD

via xx phone;

latter; in person;

by referral: OER

Confidential Information?

yes

rmation?

Compiginant: Reported by OER

County:

Address: Ken Rhame, IDEM City:

Phone:

Nature of complaint: Amoco Spill

no xx

Site location (directions): Amoco Petroleum Products, 2815 Indianapolis Bivd., P.O.Box 710

Whiting, in 46394-0710, (219) 473-7700

R------- Products Amoco Petroleum Products

B. Report of Investigation

Inspector: ELD

Investigation Date: 6/18/1996 9:30 AM

1. Nature of pollution found:

Permitted outfail 001 effluent discharge to Lake Michigan was turbid, brown/tan color. I observed a containment boom in place approximently 50 meters from the permitted outfail 001.

Within the containment boom, the lake waters was also turbid, brown/tan color.

I also observed on the shore line/ riprap, proximal to outfail 001, within the containment boom, light brown color foam and oil sheen. The amount of foam & oil sheen was minimal.

Samples taken?

Pictures taken? yes

- 2. Is condition a State Water Quality violation? Visiation of Water Quality Standard, narrative section of NPDES Permit. IN 0000108, Part I A 5 b,c,d., Page 3 of 21 (enclosure).

 See 3506 Inspection Report & Industrial Inspection state Form 35969(R2/2-94).
- Name and fittle of individuals contacted: J.G. Merphy, Peter Beronio, Shiv Baloo Address: Amoco Petroleum Co. Whiting
- 4. Corrective action taken: A Containment Soom at the permitted outfall 001 was in place.
 Altweste Vacuum Trucks were in place; actively removing/skimming surface water of residual floating foam & oil within the containment boom.
- 5. ()Written or (x) verbal orders issued? (Attach copy of written order, or give brief summary of verbal order. Requested surface & serial surveillance reports of water quality impact of the spill outside the containment boom. Short term contingency plan to recover from the spill & for the WWTP to return to compliance.

Post-It* Hux Note 7671	Date 6-28-94 perper
TO /US 7-1/120	From & L D
Co./Dept. O. (1) (4)	Co.
Phone #	Phone #
Fax # 2, 7 - 232-864)	Fax #